

CLAIMS:

1. A method of operating a cellular communication system, wherein a single paging channel is configured, the method comprising the steps of:

(a) establishing a plurality of ~~page~~ queues;

(b) assigning page requests relating to different services to each of the page queues according to a pre-determined service-to-queue mapping, the mapping being based on the type of service sought to be accessed;

(c) dequeuing the pages according to a pre-determined dequeuing algorithm; and

(d) transmitting the dequeued pages on the paging channel.

2. A method of operating a cellular communication system according to claim 1, wherein the service-to-queue mapping is determined dynamically according to the current state of the queues.

3. A method of operating a cellular communication system, wherein a plurality of paging channels are configured, the method comprising assigning page requests relating to different services to each of the paging channels according to a pre-determined service-to-paging channel mapping, the mapping being based on the type of service sought to be accessed, and transmitting each of the pages on the assigned paging channels.

4. A method of operating a cellular communication system, wherein a plurality of paging channels are configured, the method comprising the steps of:

(a) assigning page requests relating to different services to each of said paging channels according to a pre-

determined service-to-paging channel mapping, the mapping being based on the type of service sought to be accessed; and

(b) for each of said paging channels,

- establishing a plurality of page queues;
- assigning page requests relating to different services to each of the page queues according to a pre-determined service-to-queue mapping, the mapping being based on the type of service sought to be accessed;
- dequeuing the pages according to a pre-determined dequeuing algorithm; and
- transmitting the dequeued pages on the paging channel.

5. A method of operating a cellular communication system according to claim 3, wherein the service-to-paging channel mapping is determined dynamically according to the loading of the paging channels.

6. A method of operating a cellular communication system according to claim 4, wherein the service-to-paging channel mapping is determined dynamically according to the loading of the paging channels.

7. A method of operating a cellular communication system according to claim 4, wherein, for each of the paging channels, the service-to-queue mapping is determined dynamically according to the current state of the queues.

8. A method of operating a cellular communication system according to claim 6, wherein, for each of the paging channels, the service-to-queue mapping is determined dynamically according to the current state of the queues.

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9. In a cellular communication system comprising at least one base station and a plurality of mobile stations, wherein a single access channel is configured, a method for providing prioritized access to the communications system comprising the steps of:

(a) for each mobile station desiring access to the system, transmitting an access message which includes a collision rate parameter representing the number of consecutive unsuccessful access attempts which have been initiated by the mobile station;

(b) receiving at the base station said access message including the collision rate parameter;

(c) calculating from the collision rate parameters received from all mobile stations service parameters representing which services within the system are currently enabled;

(d) broadcasting from the base station a message including said service parameters;

(e) receiving said message including the service parameters at a mobile station desiring to access the system;

(f) comparing within the mobile station the service parameters with the service sought to be accessed; and

(g) inhibiting the transmission of an access attempt if the service sought to be accessed has been disabled.

10. In a cellular communication system comprising at least one base station and a plurality of mobile stations, wherein a plurality of access channels are configured, a method for providing prioritized access to the communications system comprising the steps of:

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(a) broadcasting from the base station a message including service parameters configured according to a pre-determined service-to-access channel mapping;

5 (b) receiving said message including the service parameters at a mobile station desiring to access the system;

(c) comparing within the mobile station said service parameters with the service sought to be accessed;

(d) determining the access channels to be used with the service sought to be accessed; and

10 (e) transmitting an access attempt on one of the access channels determined in step (d).

11. A method as set forth in claim 10 wherein the service-to-access channel mapping is determined dynamically according to the loading of the access channels configured within the system.

15 12. In a cellular communication system comprising at least one base station and a plurality of mobile stations, wherein a plurality of access channels are configured, a method for providing prioritized access to the communications system comprising the steps of:

20 (a) for each mobile station desiring access to the system, transmitting an access message which includes a collision rate parameter representing the number of consecutive unsuccessful access attempts which have been initiated by the mobile station;

25 (b) receiving at the base station said access message including the collision rate parameter;

(c) calculating from the collision rate parameters received from all mobile stations service parameters representing which services within the system are currently

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enabled, and incorporating a pre-determined service-to-access channel mapping;

(d) broadcasting from the base station a message including said service parameters;

5 (e) receiving said message including the service parameters at a mobile station desiring to access the system;

(f) comparing within the mobile station the service parameters with the service sought to be accessed;

10 (g) inhibiting the transmission of an access attempt if the service sought to be accessed has been disabled; and

(h) for services which are enabled, determining from the service parameters the access channels to be used with the service sought to be accessed and transmitting an access attempt on one of said access channels.

15 13. A method as set forth in claim 12 wherein the service-to-access channel mapping is determined dynamically according to the loading of the access channels configured within the system.

20 14. A method as set forth in claim 9 wherein the service parameters representing which services within the system are currently enabled are established by:

(a) calculating from the collision rate parameters received from all mobile stations a contention rate parameter representing the collision rate for the system; and

(b) for each service accessing the system,

25 • comparing the contention rate parameter to a pre-determined contention rate threshold for the service; and

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- (c) dequeuing the pages according to a pre-determined dequeuing algorithm; and

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(d) transmitting each of the dequeued pages on one of the paging channels.

17. A method of operating a cellular communication system according to claim 16, wherein the service-to-queue mapping is
5 determined dynamically according to the current state of the queues.

18. A method of operating a cellular communication system according to claim 16 wherein the dequeued pages are transmitted on the paging channels in round-robin fashion.

10 19. A method of operating a cellular communication system comprising at least one base station and a plurality of mobile stations, the method comprising the steps of:

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15 (a) for each mobile station desiring access to the system, transmitting an access message which includes a collision rate parameter representing the number of consecutive unsuccessful access attempts which have been initiated by the mobile station;

(b) receiving at the base station said access message including the collision rate parameter;

20 (c) calculating from the collision rate parameters received from all mobile stations service parameters representing which services within the system are currently enabled; and

25 (d) inhibiting the transmission of a page if the service sought to be accessed has been disabled.

20. A cellular communication system, wherein a single paging channel is configured, the system comprising:

(a) a plurality of page queues;

5 (c) means for dequeuing the pages according to a pre-determined dequeuing algorithm; and

21. A cellular communication system according to claim 20, wherein the service-to-queue mapping is determined dynamically according to the current state of the queues.

22. A cellular communication system, wherein a plurality of paging channels are configured, the system comprising means for assigning page requests relating to different services to each of the paging channels according to a pre-determined service-to-paging channel mapping, the mapping being based on the type of service sought to be accessed, and means for transmitting each of the pages on the assigned paging channels.

23. A cellular communication system, wherein a plurality of paging channels are configured, the system comprising:

(a) means for assigning page requests relating to different services to each of said paging channels according to a pre-determined service-to-paging channel mapping, the mapping being based on the type of service sought to be accessed; and

(b) for each of said paging channels,

- a plurality of page queues;

- means for assigning page requests relating to different services to each of the page queues according to a pre-determined service-to-queue mapping, the mapping being based on the type of service sought to be accessed;
- means for dequeuing the pages according to a pre-determined dequeuing algorithm; and
- means for transmitting the dequeued pages on the paging channel.

24. A cellular communication system according to claim 22, wherein the service-to-paging channel mapping is determined dynamically according to the loading of the paging channels.

25. A cellular communication system according to claim 23, wherein the service-to-paging channel mapping is determined dynamically according to the loading of the paging channels.

26. A cellular communication system according to claim 23, wherein, for each of the paging channels, the service-to-queue mapping is determined dynamically according to the current state of the queues.

27. A cellular communication system according to claim 25, wherein, for each of the paging channels, the service-to-queue mapping is determined dynamically according to the current state of the queues.

28. A cellular communication system comprising at least one base station and a plurality of mobile stations, wherein a single access channel is configured, the system comprising:

(a) for each mobile station desiring access to the system, means for transmitting an access message which includes a collision rate parameter representing the number of

consecutive unsuccessful access attempts which have been initiated by the mobile station;

(b) means for receiving at the base station said access message including the collision rate parameter;

5 (c) means for calculating from the collision rate parameters received from all mobile stations service parameters representing which services within the system are currently enabled;

10 (d) means for broadcasting from the base station a message including said service parameters;

(e) means for receiving said message including the service parameters at a mobile station desiring to access the system;

15 (f) means for comparing within the mobile station the service parameters with the service sought to be accessed; and

(g) means for inhibiting the transmission of an access attempt if the service sought to be accessed has been disabled.

29. A cellular communication system comprising at least one base station and a plurality of mobile stations, wherein a
20 plurality of access channels are configured, the system comprising:

(a) means for broadcasting from the base station a message including service parameters configured according to a pre-determined service-to-access channel mapping;

25 (b) means for receiving said message including the service parameters at a mobile station desiring to access the system;

(c) means for comparing within the mobile station said service parameters with the service sought to be accessed;

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5 30. A system as set forth in claim 29 wherein the service-to-access channel mapping is determined dynamically according to the loading of the access channels configured within the system.

31. A cellular communication system comprising at least one base station and a plurality of mobile stations, wherein a plurality of access channels are configured, the system comprising:

(a) for each mobile station desiring access to the system, means for transmitting an access message which includes a collision rate parameter representing the number of consecutive unsuccessful access attempts which have been initiated by the mobile station;

(b) means for receiving at the base station said access message including the collision rate parameter;

(c) means for calculating from the collision rate parameters received from all mobile stations service parameters representing which services within the system are currently enabled, and incorporating a pre-determined service-to-access channel mapping;

(d) means for broadcasting from the base station said
25 message including said service parameters;

(e) means for receiving said message including the service parameters at a mobile station desiring to access the system;

(f) means for comparing within the mobile station the service parameters with the service sought to be accessed;

(g) means for inhibiting the transmission of an access attempt if the service sought to be accessed has been disabled;

5 and

(h) for services which are enabled, means for determining from the service parameters the access channels to be used with the service sought to be accessed and means for transmitting an access attempt on one of said access channels.

10 32. A system as set forth in claim 31 wherein the service-to-access channel mapping is determined dynamically according to the loading of the access channels associated with each paging channel configured within the system.

15 33. A system as set forth in claim 28, wherein the means for calculating the service parameters representing which services within the system are currently enabled comprise:

(a) means for calculating from the collision rate parameters received from all mobile stations a contention rate parameter representing the collision rate for the system; and

20 (b) for each service accessing the system,

- means for comparing the contention rate parameter to a pre-determined contention rate threshold for the service; and
- means for disabling services for which the contention rate parameter exceeds the contention rate threshold for the service.

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34. A system as set forth in claim 28, wherein the means for calculating the service parameters representing which services within the system are currently enabled comprise:

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for each enabled service accessing the system,

(a) means for calculating from the collision rate parameters received from all mobile stations a service contention rate parameter representing the collision rate for that service;

(b) where the service contention rate parameter exceeds a pre-determined maximum contention rate threshold for the service, means for disabling one or more currently-enabled services with a lower priority; and

(c) where the service contention rate parameter is below a pre-determined minimum contention rate threshold for the service, means for enabling one or more currently-disabled services with a lower priority.

35. A cellular communication system, wherein a plurality of paging channels are configured, the system comprising:

(a) a plurality of page queues;

(b) means for assigning page requests relating to different services to each of the page queues according to a pre-determined service-to-queue mapping, the mapping being based on the type of service sought to be accessed;

(c) means for dequeuing the pages according to a pre-determined dequeuing algorithm; and

(d) means for transmitting each of the dequeued pages on one of the paging channels.

36. A cellular communication system according to claim 35, wherein the service-to-queue mapping is determined dynamically according to the current state of the queues.

38. A cellular communication system comprising at least one base station and a plurality of mobile stations, the system comprising:

(b) means for receiving at the base station said access message including the collision rate parameter;

(d) means for inhibiting the transmission of a page if the service sought to be accessed has been disabled.

(a) establishing a plurality of page queues;

(b) assigning page requests relating to different services to each of the page queues according to a pre-determined service-to-queue mapping, the mapping being based on the type of service sought to be accessed;

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(c) dequeuing the pages according to a pre-determined dequeuing algorithm; and

(d) transmitting the dequeued pages on the paging channel.

5 40. A computer-readable medium according to claim 39, wherein the service-to-queue mapping is determined dynamically according to the current state of the queues.

10 41. A computer-readable medium for a base station of a cellular communication system, wherein a plurality of paging channels are configured, the computer-readable medium having stored instructions for assigning page requests relating to different services to each of the paging channels according to a pre-determined service-to-paging channel mapping, the mapping being based on the type of service sought to be accessed, and
15 transmitting each of the pages on the assigned paging channels.

42. A computer-readable medium for a base station of a cellular communication system, wherein a plurality of paging channels are configured, the computer-readable medium having stored instructions for:

20 (a) assigning page requests relating to different services to each of said paging channels according to a pre-determined service-to-paging channel mapping, the mapping being based on the type of service sought to be accessed; and

(b) for each of said paging channels,

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- establishing a plurality of page queues;
 - assigning page requests relating to different services to each of the page queues according to a pre-determined service-to-queue mapping, the mapping being based on the type of service sought to be accessed;
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- dequeuing the pages according to a pre-determined dequeuing algorithm; and
- transmitting the dequeued pages on the paging channel.

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43. A computer-readable medium according to claim 41, wherein the service-to-paging channel mapping is determined dynamically according to the loading of the paging channels.

44. A computer-readable medium according to claim 42, wherein the service-to-paging channel mapping is determined dynamically according to the loading of the paging channels.

45. A computer-readable medium according to claim 42, wherein, for each of the paging channels, the service-to-queue mapping is determined dynamically according to the current state of the queues.

46. A computer-readable medium according to claim 44, wherein, for each of the paging channels, the service-to-queue mapping is determined dynamically according to the current state of the queues.

47. A computer-readable medium for a base station of a cellular communication system, wherein a plurality of paging channels are configured, the computer-readable medium having stored instructions for:

(a) establishing a plurality of page queues;

(b) assigning page requests relating to different services to each of the page queues according to a pre-determined service-to-queue mapping, the mapping being based on the type of service sought to be accessed;

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(d) transmitting each of the dequeued pages on one of the paging channels.

49. A computer-readable medium according to claim 47 wherein the dequeued pages are transmitted on the paging channels in round-robin fashion.

(a) receiving at the base station an access message from each mobile station desiring access to the system which includes a collision rate parameter representing the number of consecutive unsuccessful access attempts which have been initiated by the mobile station;

20 (b) calculating from the collision rate parameters
received from all mobile stations service parameters
representing which services within the system are currently
enabled; and

(c) broadcasting from the base station a message
25 including said service parameters.

51. A computer-readable medium for a base station of a cellular communication system, wherein a plurality of access channels are configured, the computer-readable medium having stored instructions for broadcasting from the base station a

message including service parameters configured according to a pre-determined service-to-access channel mapping.

52. A computer-readable medium according to claim 51 wherein the service-to-access channel mapping is determined dynamically according to the loading of the access channels configured within the system.

53. A computer-readable medium for a base station of a cellular communication system which also includes a plurality of mobile stations, wherein a plurality of access channels are configured, the computer-readable medium having stored instructions for:

(a) receiving at the base station an access message from each mobile station desiring access to the system which includes a collision rate parameter representing the number of consecutive unsuccessful access attempts which have been initiated by the mobile station;

(b) calculating from the collision rate parameters received from all mobile stations service parameters representing which services within the system are currently enabled, and incorporating a pre-determined service-to-access channel mapping;

(c) broadcasting from the base station a message including the service parameters.

54. A computer-readable medium according to claim 53 wherein the service-to-access channel mapping is determined dynamically according to the loading of the access channels configured within the system.

55. A computer-readable medium according to claim 50 wherein the service parameters representing which services within the system are currently enabled are established by:

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(a) calculating from the collision rate parameters received from all mobile stations a contention rate parameter representing the collision rate for the system; and

(b) for each service accessing the system,

- comparing the contention rate parameter to a pre-determined contention rate threshold for the service; and
- disabling services for which the contention rate parameter exceeds the contention rate threshold for the service.

56. A computer-readable medium according to claim 50 wherein the service parameters representing which services within the system are currently enabled are established by:

for each enabled service accessing the system,

(a) calculating from the collision rate parameters received from all mobile stations a service contention rate parameter representing the collision rate for that service;

(b) where the service contention rate parameter exceeds a pre-determined maximum contention rate threshold for the service, disabling one or more currently-enabled services with a lower priority; and

(c) where the service contention rate parameter is below a pre-determined minimum contention rate threshold for the service, enabling one or more currently-disabled services with a lower priority.

57. A computer-readable medium for a base station of a cellular communication system which also includes a plurality of mobile stations, the computer-readable medium having stored instructions for:

59. A computer-readable medium for a mobile station of a cellular communication system which also includes at least one base station, wherein a plurality of access channels are

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parameters with the service sought to be accessed;

the service sought to be accessed; and

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parameters with the service sought to be accessed;

the service sought to be accessed has been disabled; and

(e) for services which are enabled, determining from the service parameters the access channels to be used with the service sought to be accessed and transmitting an access attempt on one of said access channels.

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